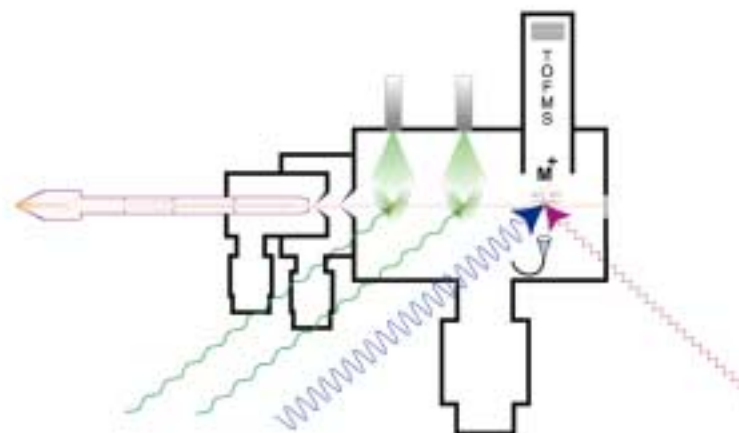
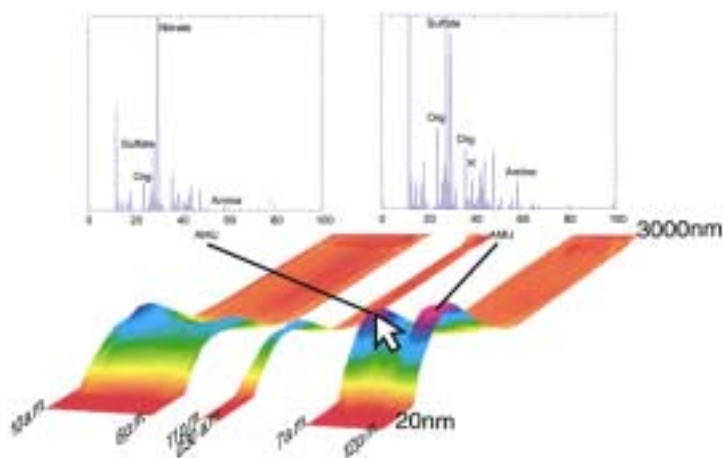
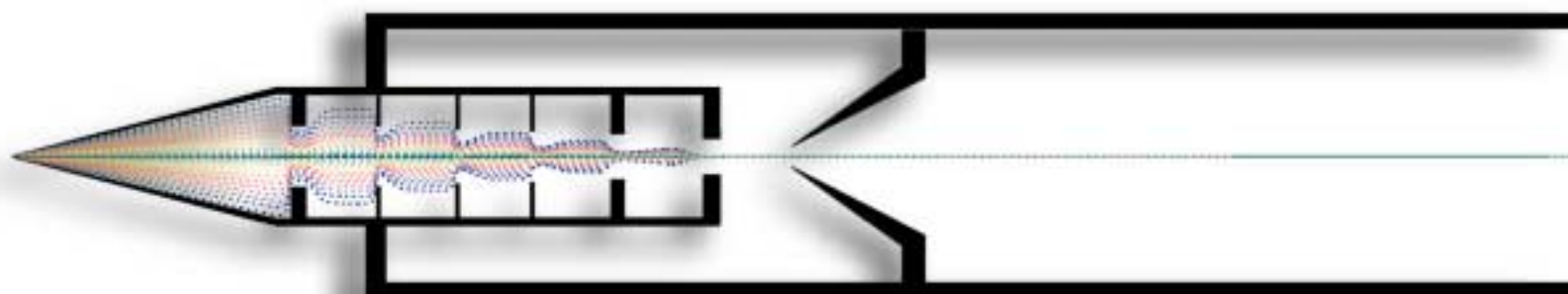


# Measurements of Single Particle Size and Composition During TexAQS 2000



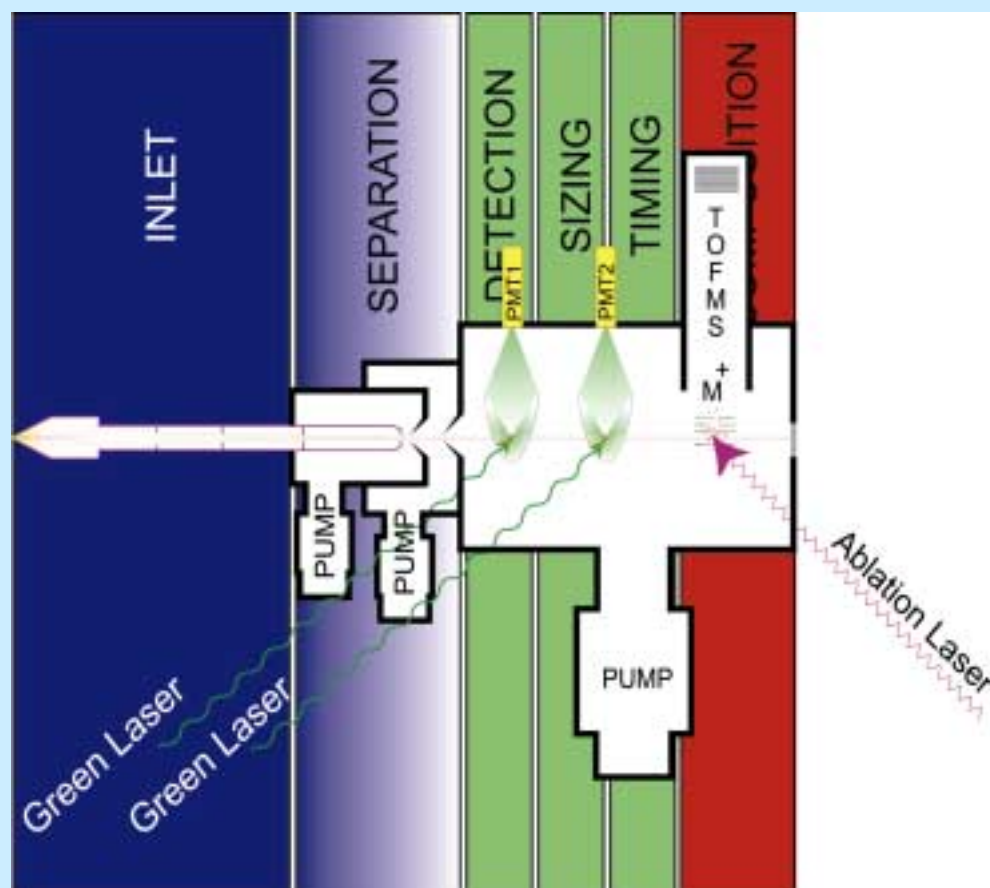
D. Imre, A. Zelenyuk, G. Buzorius, R. Mugno, and P. Imrich

# OUTLINE

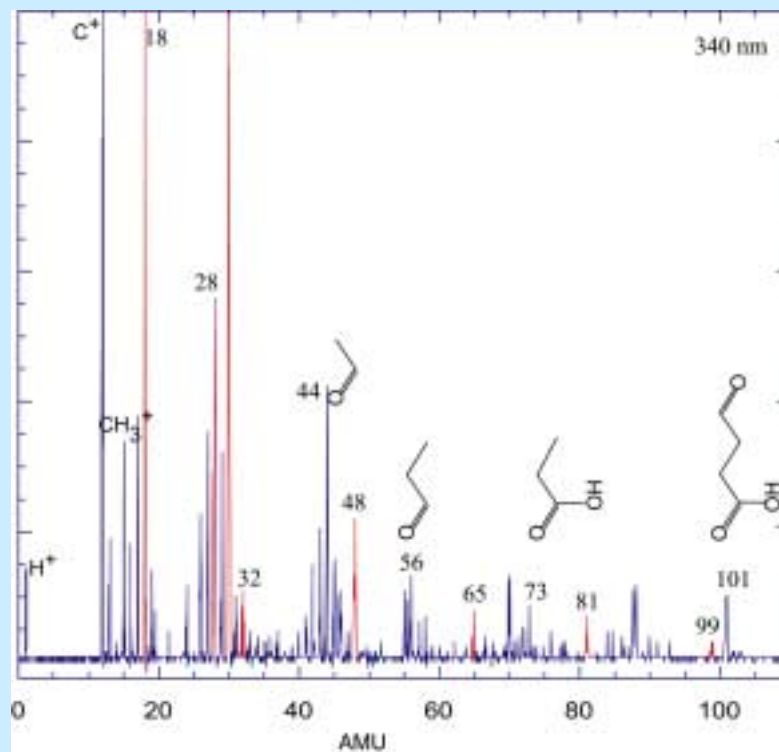
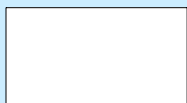
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- < SPLAT-MS the basics
- < Some dry numbers from Houston
- < A different way of looking at the data
  - 4 Classifying and visualizing the entire set
  - 4 Examining individual particle spectra
- < The night of the nitrates

# SPLAT-MS the BASICS



# MASS SPECTRUM OF AMMONIUM SULFATE/SUCCINIC ACID PARTICLE



# FIELD DEPLOYMENTS

Texas 2000 Air Quality Field Study  
Houston Williams Tower (Summer 2000)



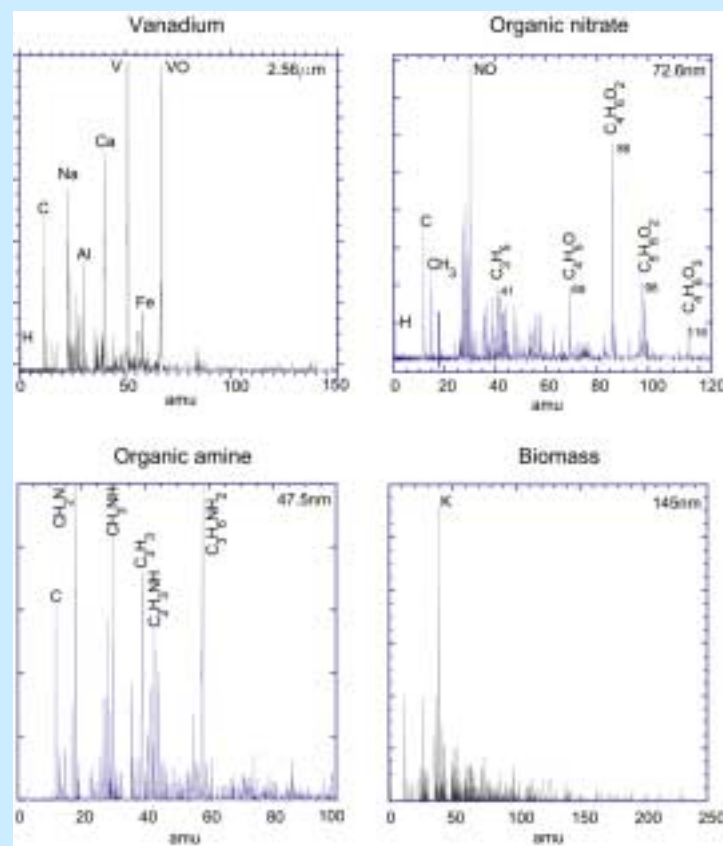
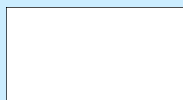
Aerosol Characterization Experiment  
Cheju Island Korea (Spring 2001)



PM2.5 Technology Assessment and  
Characterization Study-NY (Summer 2001)



# 4 little Particles from Texas

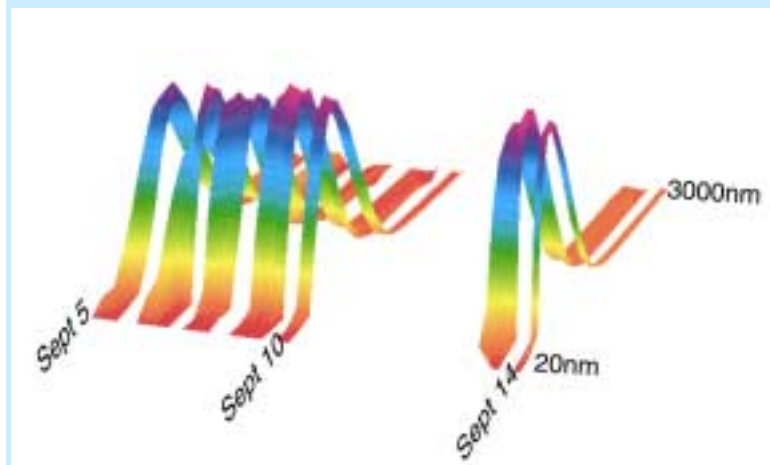
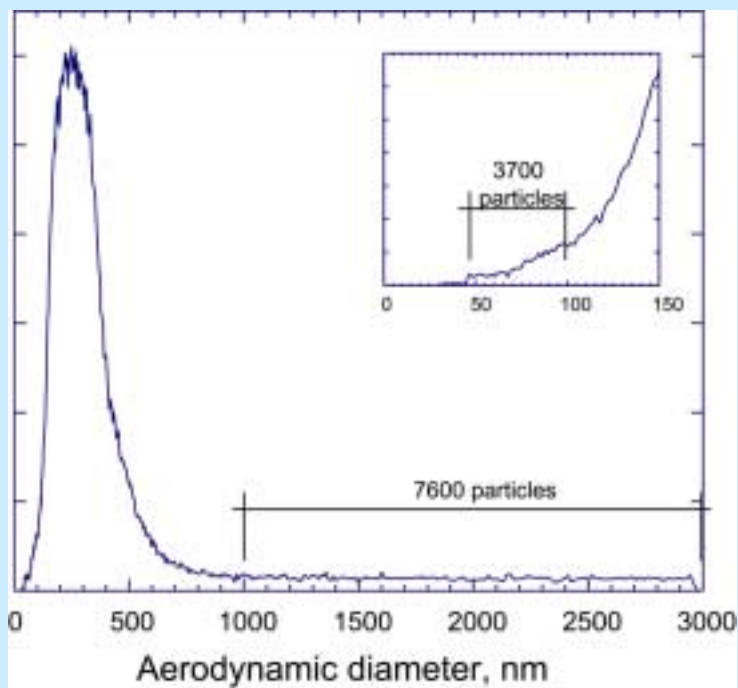
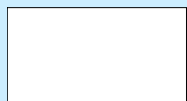


# SOME DRY NUMBERS

- ¥ SPLAT-MS performed very well during its maiden voyage.
- ¥ **Total sampling time:** ~90hr
- ¥ **Total laser shots:** ~2.5 million
- ¥ **Number of hit particles:** 230,000
- ¥ **Rate:** 1 — 2 particles per second
- ¥ **Size range:** from 47 nm to 3.5  $\mu\text{m}$

# SIZE DISTRIBUTION OF 163,000 PARTICLES FROM HOUSTON

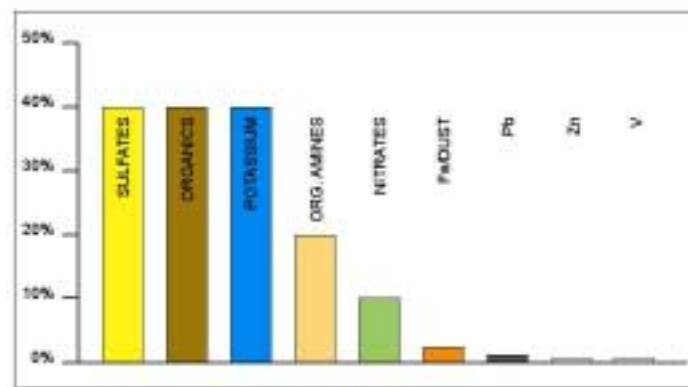
(60 HOURS OF DATA COLLECTION)





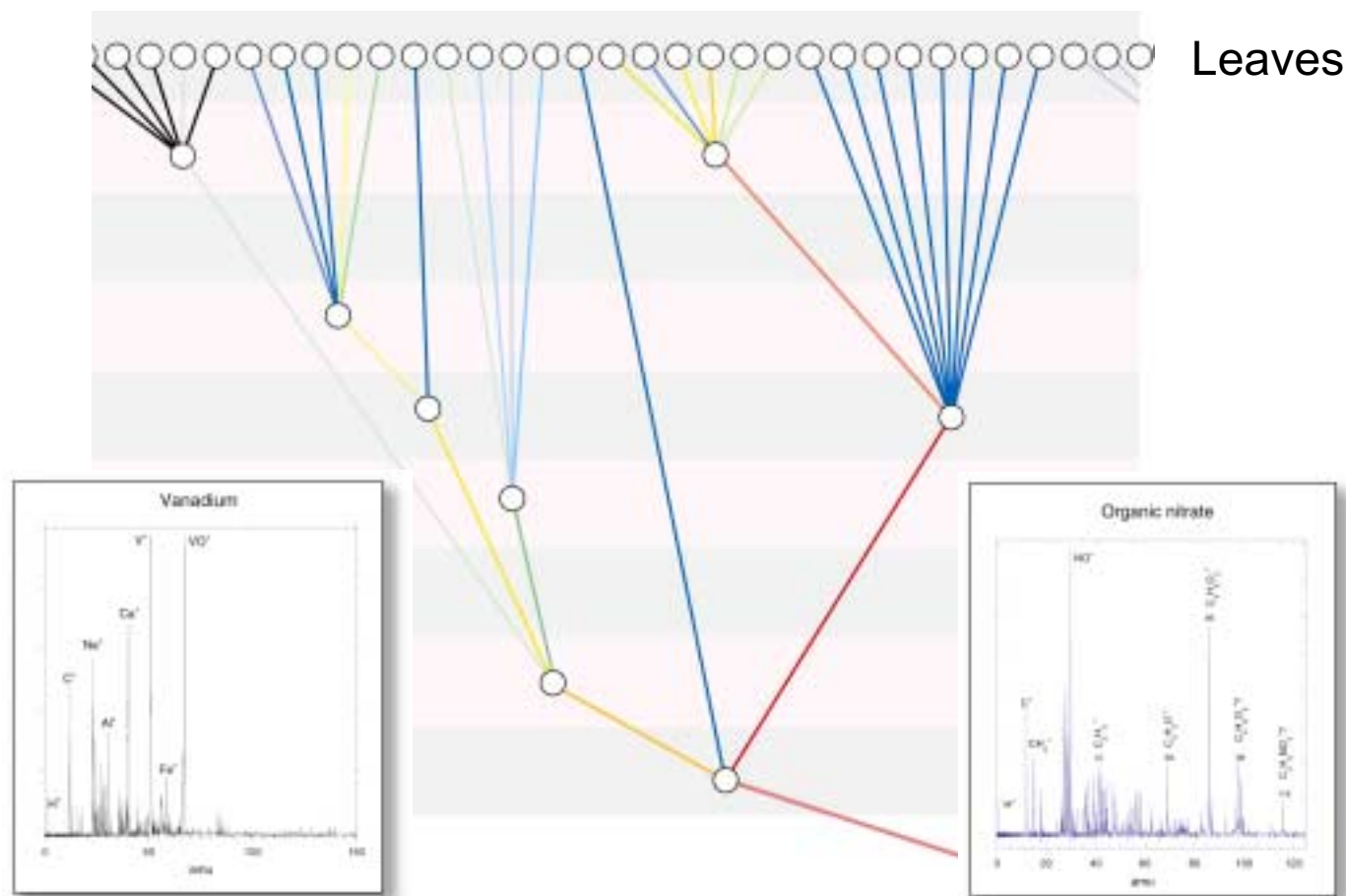
# SOME MORE DRY NUMBERS

¥ 40%	sulfate
¥ 40%	organics
¥ 40%	K
¥ 20%	organic amine
¥ 10%	nitrate
¥ 4%	Fe/dust
¥ 2%	Pb
¥ 1%	Zn
¥ 1%	V

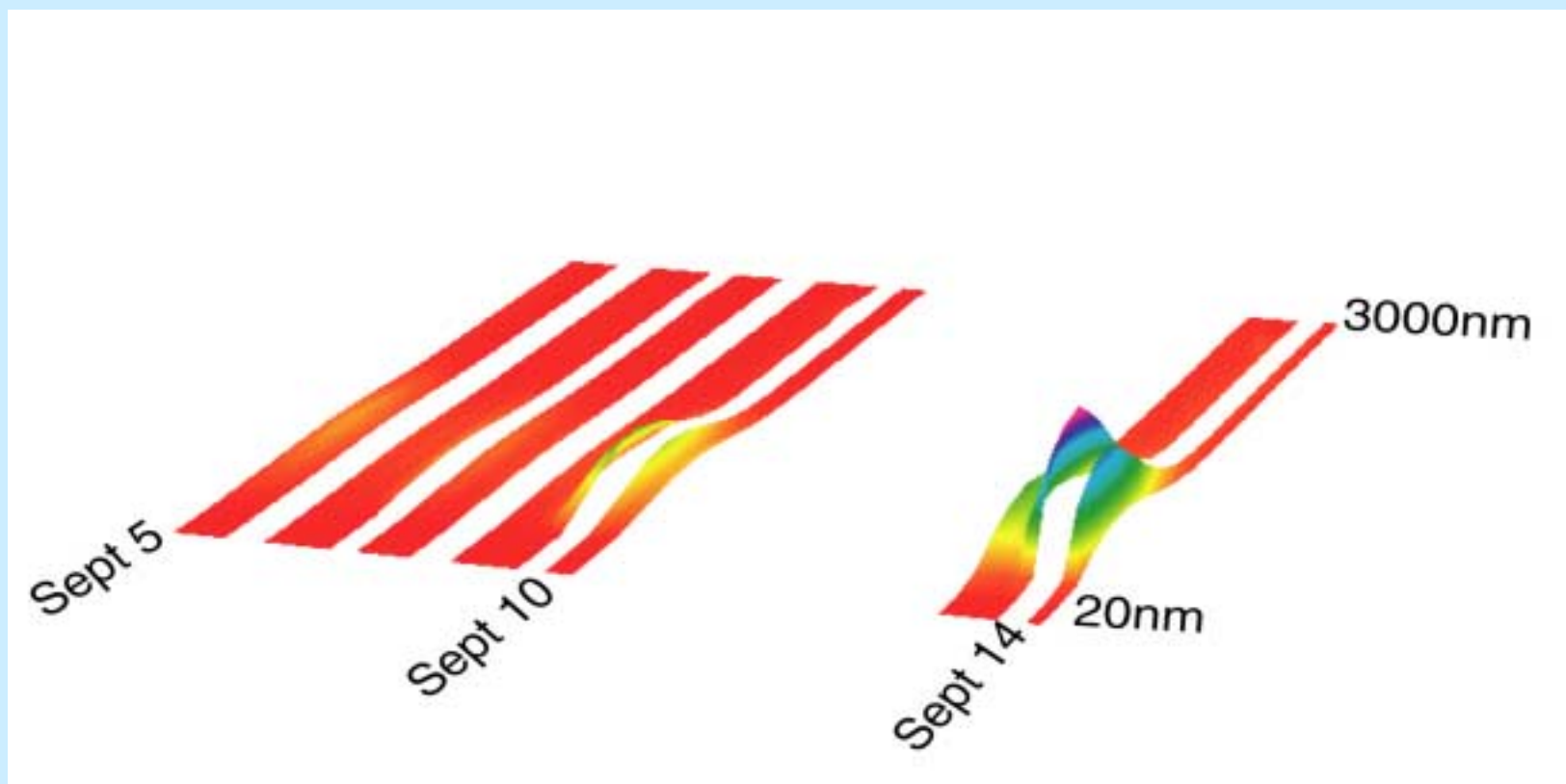


# The Dendrogram or Classification Tree

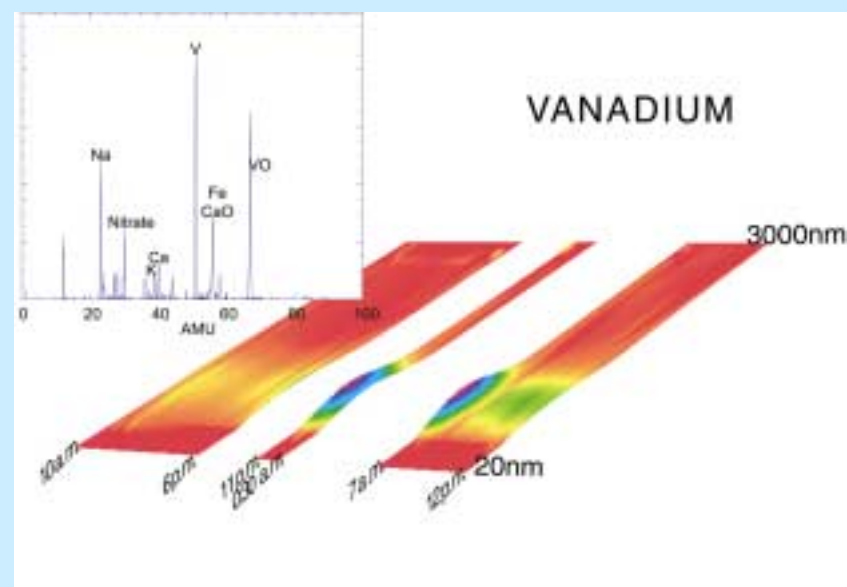
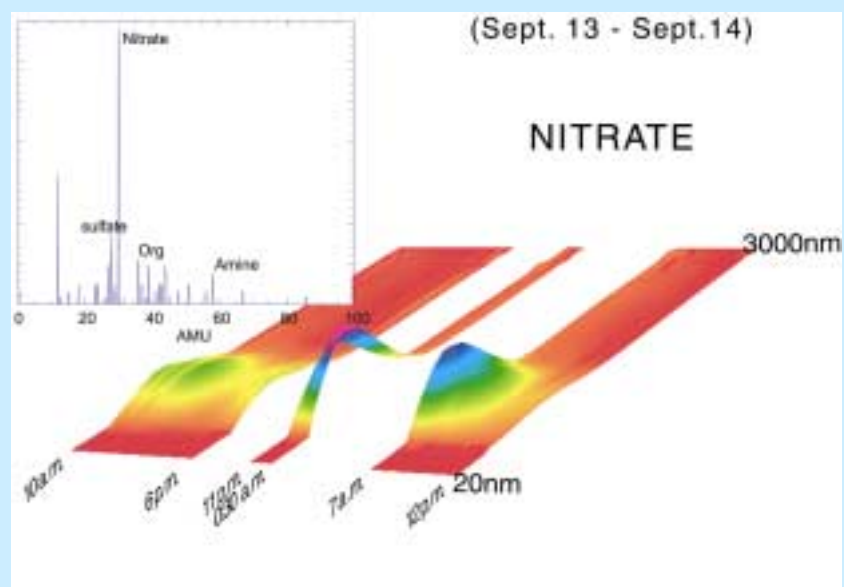
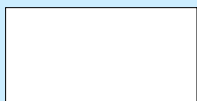
S  
I  
M  
I  
L  
A  
R  
I  
T  
Y



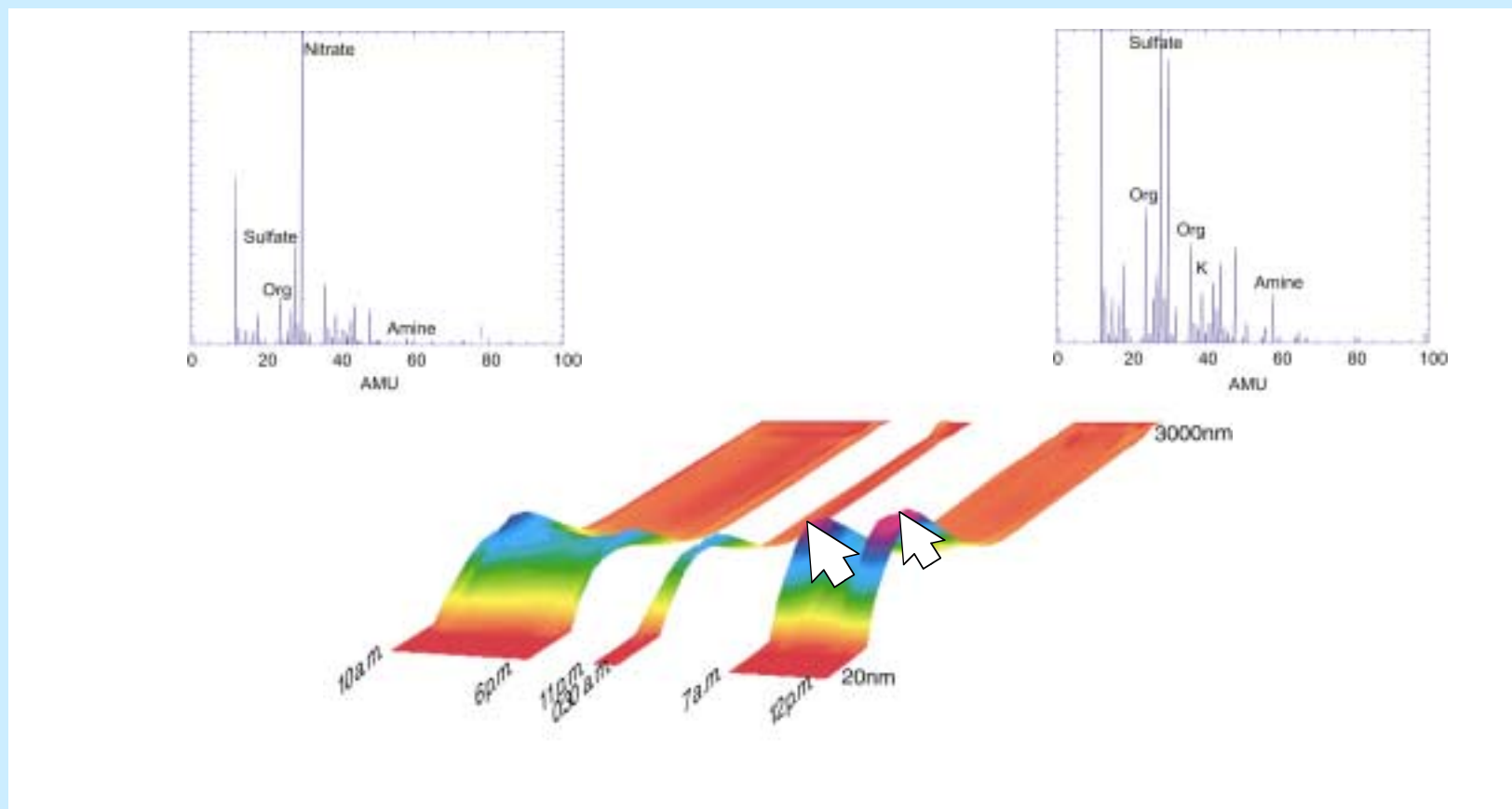
# NITRATES



# ZOOMING IN



# ZOOMING IN ON SULFATES



# Where Do We Go From Here

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## < **INSTRUMENT**

- 4 We are in the process of constructing a compact SPLAT-MS
- 4 Improve on quantitative
- 4 Solve the organics in aerosol problem
- 4 Develop a system to measure size, hygroscopicity, density, and composition

## < **ANALYSIS and VISUALIZATION**

- 4 Finish data analysis
- 4 Improve on the tools; add gas phase, meteorology, etc.
- 4 . we have just beg un